

~~TOP SECRET~~

[Redacted]

25X1

Copy 1 of 1

28 OCT 1963

MEMORANDUM FOR : Deputy Director (Science and Technology)
SUBJECT : Transmittal of OXCART Status Report

Attached is a current OXCART status report.

[Redacted]

25X1

for JACK C. LEDFORD
COLONEL, USAF
Assistant Director
(Special Activities)

Atts: As Stated

~~TOP SECRET~~

TOP SECRET

28 OCT 1963

Attachment I to

25X1

OX CART STATUS REPORT

1. Since the first flight of an OXCART A-12 aircraft, 26 April 1962, 424 flights, totaling 584:08 flight hours, have been made utilizing a total of nine aircraft at the [redacted] as listed on Attachment II. Of these totals, 134 flights totaling 145:37 hours were conducted with aircraft having two J-58 engines installed. The J-58 is the engine necessary for Mach number extension. The only aircraft not now using the J-58 engine is the dual-place trainer and it will eventually be retrofitted with J-58 engines. J-58 engine development status is shown on Attachment III.

25X1

2. Eight A-12 aircraft (accounting for the loss of #123) currently are in flight test. On 4 October 1963 the tenth aircraft was delivered to the [redacted] Attachment IV contains an estimated delivery schedule for the remaining five A-12 aircraft under procurement.

25X1

3. To date the longest A-12 flight has been 3:06 hours, the highest speed achieved has been Mach 3.06, and the highest altitude has been 75,800 feet.

4. The aircraft, engines, and other critical components, including the inertial navigation system, stability augmentation system, autopilot, air induction system, pilot environment equipment, cameras and [redacted] all specifically developed for the program, have performed reasonably well within the limits of testing so far in the flight test program. One of the most critical problems confronting the program is the occurrence of duct roughness which has been most severe in the Mach 2.4 - 2.8 region. Various modifications have been made to a flight test aircraft which have reduced the extent and severity of the roughness and which appear to be pinpointing airflow separation as the primary inducing factor.

25X1

5. Laboratory testing of the Inertial Navigation System (INS) was conducted during the period January 1961 - September 1961 and was demonstrating errors of less than 1 N.M./HR. After 5 hours of operation with fixes at 3 and 4.5 hours, the error was

TOP SECRET

TOP SECRET

Attachment I to

25X1

Page 2

3 N.M. compared to the specification requirement of a 4.5 N.M. error. From March 1962 - May 1962, 12 flight tests were conducted with the INS installed in a U-2. Excessive errors were being obtained due to platform misorientation. Fixes were incorporated and 9 subsequent flights of an INS installed in a U-2 were conducted from October 1962 - December 1962 with excellent results. See Attachment V for representative INS flight test results during this period. Since November 1962 there have been approximately 70 INS flights in the A-12 with the INS performance steadily improving. Attachment V shows results obtained during August 1963. The INS is presently installed in 5 A-12's and two additional systems are ready for installation.

6. Foreign object damage which has resulted in 20 J-58 engine removals and extensive aircraft nacelle modification suspended all Mach number extension flights between 5 April and 17 May 1962. Corrective measures have been taken and no further removals have occurred.

7. Corrective actions are underway for the two chronic engine problems involving excessive oil consumption and afterburner cooling liner cracking. One engine is currently under teardown investigation after an apparent accessory drive system failure sustained on 24 October; further details are unavailable at this time.

8. Aircraft #123 crashed on 24 May 1963. After intensive investigation by an accident board, it was concluded that the accident resulted from icing in the pitot tube which gave erroneous instrument readings to the pilot and led to a series of events culminating in a crash. The pilot ejected successfully. A new model pitot tube will be installed to prevent a recurrence.

25X1

TOP SECRET

TOP SECRET

Attachment I to



25X1

Page 3

25X1

10. The three A-12 camera systems, consisting of two entirely new cameras and a modified camera for the U-2 program are all in flight test. There have been a total of over 50 flights with cameras operating and results of these tests have been generally encouraging.

11. In the next few months maximum effort will be directed to further defining and eliminating the duct roughness problem and then reaching the intended speed and altitude so that the aircraft related systems, equipment and sensors can be tested under sustained high temperature and high altitude environment. Recently tests have been initiated to establish sustained time above Mach 2.0 for heat soak demonstration. Attachment VI is a summary of flight time above Mach 2.0 for aircraft #122 on five recent flights specifically designated for heat soak for which data are available. Meanwhile, seven of eventual nine operational pilots, soloed in the A-12 and are undergoing training. Bases for aerial refueling tankers are being readied and other logistical and operational preparations are underway.

TOP SECRET

TOP SECRET

ATTACHMENT II to

25X1

AIRCRAFT FLIGHT TEST SUMMARY *thru 25 Oct 63*

The following is a recapitulation of flight test activity since the first flight in April 1962.

Aircraft 121 - 88 flights (total time 87:26 hours). 36 flights were with J-75 engines; 18 flights were with one J-75 engine and one J-58 engine. First flight with two J-58 engines occurred on 9 March 1963.

Aircraft 122 - 32 flights (total time 28:07 hours) with two J-58 engines.

Aircraft 123 - Crashed on 24 May 1963 after 79 flights (total time 136:10 hours) with two J-75 engines.

Aircraft 124 - (dual-seat trainer) - 157 flights (total time 242:43 hours) with two J-75 engines.

Aircraft 125 - 26 flights (total time 30:05 hours) with two J-58 engines.

Aircraft 126 - 29 flights (total time 44:40 hours) with two J-58 engines.

Aircraft 127 - 9 flights (total time 10:47 hours) with two J-58 engines.

Aircraft 128 - 1 flight (total time 0:52 hours) with two J-58 engines.

Aircraft 129 - 3 flights (total time 3:18 hours) with two J-58 engines.

Aircraft 130 - In final assembly at the operating location.

TOP SECRET

TOP SECRET

ATTACHMENT III to

25X1

J-58 ENGINE DEVELOPMENT SUMMARY

Total J-58 ground test hours	10,000 hours
JT11D-20 engine ground test hours	7,000 hours
Engine ground test hours above Mach 2	1,700 hours
Engine ground test hours at or above Mach 3	1,100 hours
Engine Flight Hours	320 hours

Included in the above development summary is the official 50 hour flight suitability test completed 4 January 1963. Also of interest is the completion in September 1963 of 146 hours of continuous mission cycle endurance testing on one engine. This latter test, the first in a series of informal attempts leading toward the official 150 hour engine qualification test scheduled for completion in June 1963, indicated the need for continuing development in the areas of performance and durability.

TOP SECRET

TOP SECRET

ATTACHMENT IV to

25X1

A-12 AIRCRAFT DELIVERY STATUS

Aircraft

Delivery to test site

121-130

OX CART

Now at site

131

November 12

132

December 17

133

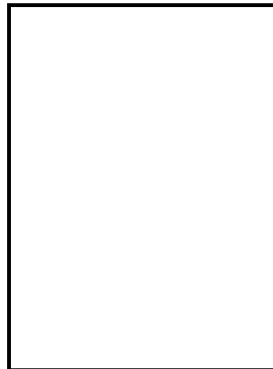
January 15

134

February 4

135

March 17



TOP SECRET

INS FLIGHTS VS. SPECIFICATION REQUIREMENTS

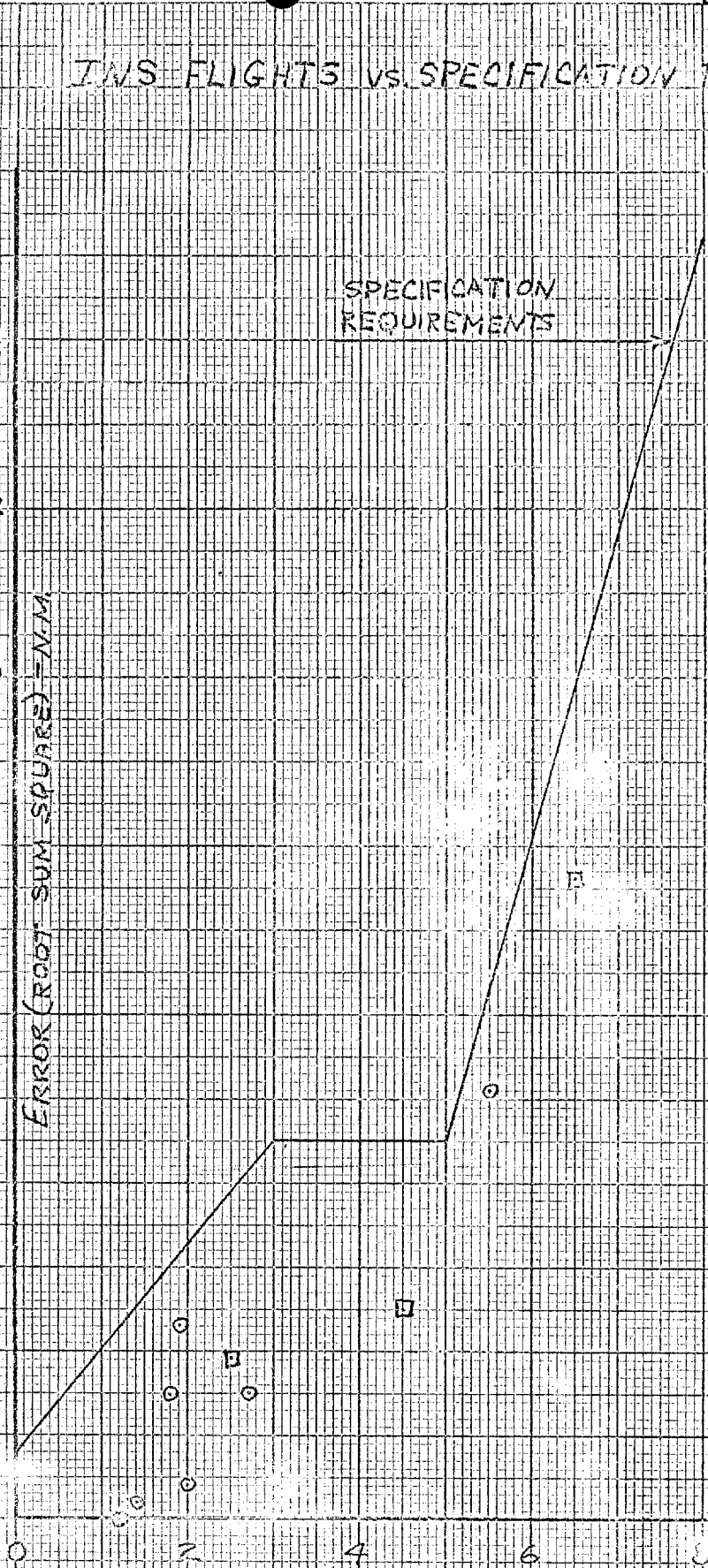
□ - U-2 FLIGHTS
○ - A-12 FLIGHTS

SPECIFICATION REQUIREMENTS

ERROR (ROOT SUM SQUARE) - N.M.

16
14
12
10
8
6
4
2
0

TIME - HOURS



TOP SECRET

TOP SECRET

ATTACHMENT VI to



25X1

AIRCRAFT #122

FLIGHT TIME VERSUS MACH NUMBER

<u>Flight Number</u>	<u>Time in Hours:Minutes Above Mach</u>		
	<u>2.0</u>	<u>2.2</u>	<u>2.4</u>
19	:20	:10	0
20	:32	:20	0
23	:22	:17	:02
24	:39	:32	:01
25	<u>:42</u>	<u>:36</u>	<u>:01</u>
	2:35	1:55	:04

TOP SECRET

Page Denied